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AUTHOR Landry, Richard G.
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ABSTRACT

A brief review of the literature on bilingualism prefaces the study. Research which points up possible deleterious effects of bilingualism is cited. Two additional studies by Reigal et. al., and Peal and Lambert raise the possibility of bilingualism having some positive relationship to creativity. In this study, an attempt was made to examine the proposition that experience with two languages during childhood is related meaningfully to later verbal creative functioning. Hypotheses were tested on second and fourth graders from a pair of urban elementary schools, one bilingual and one monolingual. Findings included: (1) no significant differences at the second grade level in fluency and flexibility on verbal and figural measures of creativity; and (2) at the fourth grade level, significant differences between the bilingual and monolingual groups, but not between the sexes. Differences are discussed and tentative conclusions presented. The bilingual experience in childhood was felt to result in subsequent greater development of potential creativity. (TL)

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BILINGUALISM AND CREATIVE ABILITIES

RICHARD G. LANDRY

UNIVERSITY OF NORTH DAKOTA

Since as early as the 1920's when Saer (1922) and Smith (1923) reported research on the topic of bilingualism, psychologists, linguists and researchers have investigated how bilingualism is related to the intellectual, linguistic and reasoning growth of children. The present study is concerned with the relationship between bilingualism and creativity.

The bilingual situations which have been studied most frequently in the past are those of immigrants who are in the process of losing the language of their country of origin and acquiring English. Such people almost invariably require English in order to conduct their affairs and converse with their friends and acquaintances. Their children, too, have enormous incentives to become competent in English, for it is the language of the school and the society in which they live.

The bilingual situation of the present study is somewhat different. The children involved are English-speaking and are learning a second language in the school. These children live in an English-speaking environment and depend for their second language knowledge almost entirely on their teachers. Thus, these children are asked to acquire a second language which is not the language of the world in which they live.

These children are considered bilingual because they possess language skills in both English and French. Although bilingualism has been defined in a myriad of contrasting and personal ways, for our purposes, we will define a bilingual as Macnamara (1967) does: "a person who possesses at least one of the language skills even to a minimal degree in their second language." In the case in point, children learn French as a second language at the elementary school level. Approximately 25 percent of the school time is spent in French. It must be noted that the second language is taught in that language and not through the medium of English. Hence, the children are considered to be truly bilingual.

This study is primarily concerned with the relationship of bilingualism and creativity. It is felt that the experience of learning a second language could prove to be positively related to creativity.

A review of some of the research which is most pertinent to this study will be presented. This review will cover the following areas relative to bilingualism and creativity: (1) bilingualism and verbal and nonverbal skills, (2) bilingualism and the measure of intelligence, and (3) creativity and subcultural studies.

Research Findings

With regards to the research on bilingualism and verbal and nonverbal skills, most of the literature suggests that the bilingual child will encounter many problems in verbal skills, such as, reading, vocabulary and

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writing, but not in nonverbal skills, such as, arithmetic. Saer (1922) and Smith (1923) state that essays written by monolinguals were superior in power of expression, choice of vocabulary, and accuracy of thought to those written by bilinguals. And the research since then has upheld these findings (Barke and Parry-Williams, 1938; Jones, 1952, 1953, 1955; Carrow, 1957). In studies involving problem arithmetic, which requires that a child extract a problem from a prose passage, and mechanical arithmetic, significant differences were found in favor of the monolinguals on the problem arithmetic, but no significant differences were found on the mechanical arithmetic (Carrow, 1957; Macnamara, 1966).

Furthermore, many investigations have attempted to show that childhood bilingualism results in many handicaps to the individual in his intellectual development because of his bilingual environment. Much of the misconception linking childhood bilingualism with intellectual impairment originated from low scores on intelligence tests which relied upon language facility (Saer, 1923; Rigg, 1928). The use of nonlanguage or nonverbal materials show that the bilingual child is not necessarily handicapped in intellectual capacity or growth (Pintner and Keller, 1922; Darcy, 1946; Jones and Stewart, 1951).

Peripherally related to the present studies are the investigations involving creativity and subcultural groups. The research indicates the subcultural groups score lower on creativity measures than a "normal" group (Lembright and Yamamoto, 1965; Madaus, 1967).

Relying on the evidence of past research, we conclude that monolinguals are generally superior to bilinguals in skills involving linguistic habits. Also, we conclude that bilingualism has no relationship with progress in mechanical arithmetic, while it is associated with poor progress in problem arithmetic. This latter development most likely flows from the linguistic deficiencies. An identical trend was seen in the measures of verbal and nonverbal intelligence. Subcultural studies seem to indicate that there is possibly a negative relationship between bilingualism and creativity.

Theoretical Considerations

Two studies raise the possibility of bilingualism having some relationship with creativity. Reigel et al. (1967) compared an American group who had learned Spanish in school to a Spanish group who went to an American school. Twenty-four American and 24 Spanish subjects gave restricted associations both in English and in Spanish to 35 stimuli under seven different instructions. In both languages, the response variation was greater for Spanish than for American subjects. This variability conforms to Torrance's definition of flexibility which he conceives as "variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies." (Torrance, 1966)

Also, Peal and Lambert (1962), in their comprehensive study, ran a factor analysis of a matrix of variables. The factor analysis supported

their hypothesis that the structure of the intellect for the bilinguals and monolinguals differed with the bilingual group possessing a more diversified set of mental abilities. They raised several hypotheses to explain their finding that the bilinguals performed better on the factor called "concept-formation or symbolic flexibility:"

> People who learn to use two languages have two symbols for every object....The monolinguals may never have been forced to form concepts or abstract ideas of things and may be more likely to think mainly in terms of concretes. They could not be expected to be as agile at concept-formation as the bilinguals and they might be handicapped comparatively.
>
> The second hypothesis is that bilinguals may have developed more flexibility in thinking. Compound bilinguals typically acquire experience in switching from one language to another, possibly trying to solve a problem while thinking in one language, and then, when blocked, switching to the other. This habit, if it were developed, could help them in their performance on tests requiring symbolic reorganization since they demand a readiness to drop one hypothesis or concept and try another. (Peal and Lambert, 1962)

For these reasons, Peal and Lambert feel that the bilingual may be more flexible in his thinking.

It is precisely in this context that the present study is undertaken. This study intends to investigate whether a child who learns a second language at the elementary school level is hampered or is benefited in his creative abilities. This study should help to clarify some of the following points: Are children who attend a bilingual school more creative in their thinking than children who have attended a monolingual school? Does learning a second language affect boys differently than it does girls? Do verbal deficiencies reported in the linguistic skills studies transfer also to the verbal measures of creativity? Are nonverbal creative abilities enhanced or hampered by bilingual schooling?

Sample and Procedures

In this study, a child is considered bilingual if he has attended a bilingual school all his elementary school years. A bilingual school is a school where a second language is taught at all grade levels. This second language is taught in that language and not in English.

The sample in this study emanates from a pair of urban elementary schools, one bilingual school and one monolingual school. These schools draw from the same socioeconomic strata of society. In an attempt to show that no differences exist in the schools before the bilingual influence, the second graders at the schools will be examined to see if any difference already exists. No differences will be expected because the schools are essentially the same and the children have grown up in approximately the same environment. The second sample will be drawn from fourth

graders and up of each school. If the hypotheses are correct, differences will be found at this level. Also, because the linguistic development of boys and girls are not the same, the possibility of a differential relationship with the sexes will be studied. Since it is important to rule out any possible bilingual influence in the home, only those children whose mother tongue is English will be included in this investigation.

Creativity is defined by the Torrance Tests of Creative Thinking. Four subtests were administered and scored, yielding four scores for each individual: verbal fluency, verbal flexibility, figural fluency, and figural flexibility. The verbal subtests used were the Product Improvement and the Unusual Uses. The figural subtests were the Incomplete Figures and the Repeated Figures. The interscorer reliability for these subtests range from .95 to .99.

Two major variables have been controlled for in this study, age in months and intelligence. Age in months is a covariate because verbal and figural skills increase with age. Intelligence, on the other hand, is defined as the student's score on the Cattell Culture-Fair Intelligence Test. This instrument is a nonverbal measure of IQ and is independent of language skill, even though it is not entirely free of cultural influences. A nonlanguage test was chosen in order to eliminate any bias introduced in favor of the monolinguals because of possible bilingual linguistic deficiencies.

Multivariate two-way analysis of variance with covariance controls for IQ and age in months (MANOVA) was used to analyze the data. The 2 by 2 design had the following cells, boys-monolingual, girls-monolingual, boys-bilingual, and girls-bilingual. The cell sizes were kept equal so as to have an orthogonal design. The cell size in the second grade sample was 8 and in the random sample it was 24. The small sample size was a function of the bilingual influence of the home.

Results

The first hypothesis that there are no significant differences between boys and girls who attend a bilingual school and boys and girls who attend a monolingual school at the second grade level in fluency and flexibility on verbal and figural measures of creativity was tested using multivariate two-way analysis of variance with covariance controls for IQ and age. The means and standard deviations of the four cells on each measure were calculated (see Appendix A) as were the adjusted means. F tests were applied to determine if the differences between the means were significant and they were not. See Table 1 for the results of this analysis. These results support our working hypothesis that there are no differences in the groups at this grade level.

The second hypothesis, however, that there are no significant differences between boys and girls who attend a bilingual school and boys and girls who attend a monolingual school in grades above the fourth in fluency and flexibility on verbal and figural measures of creativity brought different results.

TABLE 1

MEANS ADJUSTED FOR TWO COVARIATES (AGE AND IQ)
AND MULTIVARIATE F VALUES

Second Grade

Verbal Fluency

	Monolingual	Bilingual
Boys	48.250	59.125
Girls	50.500	40.599

Verbal Flexibility

	Monolingual	Bilingual
Boys	23.357	28.125
Girls	20.182	20.687

Figural Fluency

	Monolingual	Bilingual
Boys	15.250	18.600
Girls	18.125	15.167

Figural Flexibility

	Monolingual	Bilingual
Boys	13.125	14.688
Girls	13.445	12.224

Effect	F	P
Interaction	1.522	n.s.
Sex	1.624	n.s.
Lingual Group	1.534	n.s.

TABLE 2

MEANS ADJUSTED FOR TWO COVARIATES (AGE AND IQ)
AND MULTIVARIATE F VALUES

Random Sample

Verbal Fluency

	Monolingual	Bilingual
Boys	42.5557	35.9568
Girls	31.8608	40.9474

Verbal Flexibility

	Monolingual	Bilingual
Boys	21.9483	18.8882
Girls	18.0590	21.9378

Figural Fluency

	Monolingual	Bilingual
Boys	19.3776	23.8948
Girls	18.7586	21.4538

Figural Flexibility

	Monolingual	Bilingual
Boys	16.1232	18.5252
Girls	14.8770	16.1830

Effect	F	P
Interaction	2.998	0.023
Sex	1.904	n.s.
Lingual Group	2.643	0.039

The means and standard deviations of the four cells on each measure were calculated (see Appendix A) as were the adjusted means. Multivariate F tests were applied to determine if the differences between the adjusted means were significant. See Table 2 for the results of this analysis. A significant interaction was found as was a significance between the monolingual and bilingual groups. No significant differences were found between the sexes.

Univariate F's were then examined to see where the significance lay. The verbal test of fluency and flexibility led to the significant interaction effect. The boys in the monolingual situation and the girls in the bilingual situation scored the highest. The girls in the monolingual situation and the boys in the bilingual situation scored significantly lower. The significance between the monolingual group and the bilingual group was in the figural aspects of the tests of creativity. Both measures of figural creativity, that is, fluency and flexibility, were significant past the .05 level in favor of the bilinguals. Thus, our main hypothesis was confirmed. For these results, see Table 3.

Table 3

Univariate F Values

	Variable	F	P
Interaction effect	Verbal Fluency	6.688	.011
	Verbal Flex.	8.255	.005
	Figural Fluency	0.658	n.s.
	Figural Flex.	0.533	n.s.
Lingual effect	Verbal Fluency	0.152	n.s.
	Verbal Flex.	0.070	n.s.
	Figural Fluency	9.605	.003
	Figural Flex.	5.110	.026

Discussion

In this paper, comparisons have been made between groups of monolinguals and bilinguals in an attempt to examine the proposition that experience with two languages during childhood is related in a meaningful way to later verbal creative functioning. This hypothesis was confirmed in three out of four cases. Only in the case of bilingual boys in the verbal measures was the effect in the opposite direction. This apparent reversal of our hypothesis is explainable to a certain extent. The differential achievement of boys and girls at this level of education has long been investigated and girls generally achieve better than boys (McCarthy, 1954; Templin, 1957). These differences then tend to be maximized when the learning of two languages is involved.

The findings of this study seek evidence as to the role of language learning in the development of creative processes. It is proposed here that the learning of two languages during childhood be viewed as one form of enriched experience which results in the development of more of the potentialities of an individual than would otherwise be the case. There are two major ways in which a bilingual child's environment differs from that of a monolingual -- he is in contact with two cultures and is subjected to two different language systems. In what ways could each of these influences affect the child's mental development?

An individual who is in contact with two cultures may develop patterns of abilities differing from either of the cultures to which he is subjected and because of the different requirements of the dual culture in which he lives, the bicultural-bilingual child may develop a more diversified pattern of mental abilities. Assuming that each culture stresses the learning of different things at different times, the bicultural child is forced to learn more than an individual raised in only one culture.

In so far as language is concerned, an individual who is mastering two language systems may be led to pay attention to more aspects of the environment that are stressed in each of his languages. He may end up with not only different experiences being salient to him because of his skill in two languages, but with more experiences, assuming the languages and cultures involved are contrastive to at least a minimal degree. He would thus be able to use alternately his two perspectives when he switched from one language to the other.

Therefore, it is felt that the linguistic and cultural experiences of those who become bilingual in childhood results in a subsequent greater development of their potential creativity than is the case for monolinguals. The dual linguistic experience of bilinguals is thought to influence their thinking in several ways: giving them slightly different views of the world, giving them a flexible approach to problem solving and perhaps encouraging them to express themselves in different ways.

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